PRODUCT INFORMATION

STING M284 variant (human, recombinant)

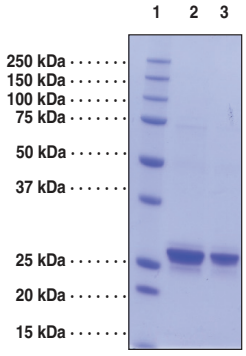
Item No. 23594

Overview and Properties

Synonyms:	Endoplasmic Reticulum Interferon Stimulator, ERIS, hSTING, MITA, Stimulator of Interferon Genes Protein, TMEM173, Transmembrane Protein 173
Source:	N-terminal Histidine-tagged human recombinant protein expressed in *E. coli*
Amino Acids:	138-379 (N-terminal truncation)
Uniprot No.:	Q86WV6
Molecular Weight:	28.8 kDa
Storage:	-80°C (as supplied); avoid freeze/thaw cycles by storing protein in aliquots
Stability:	≥2 years
Purity:	***batch specific*** (≥80% estimated by SDS-PAGE)
Supplied in:	50 mM HEPES, pH 8.0 with 150 mM sodium chloride and 10% glycerol
Protein Concentration:	***batch specific*** mg/ml
Activity:	Serial dilutions of canonical 3'3'-cGAMP were incubated with 5 µg recombinant human STING M284 variant in 50 mM HEPES, pH 7.5, 150 mM sodium chloride, 10% glycerol, and SYPRO® Orange dye at 4°C.[1] The reaction was read on a BioRad CFX96 Touch™ Real-Time PCR Detection System at 4-100°C.2 The binding of the ligand stabilizes the protein structure, increasing the melting temperature (T_m), which is detected *via* a thermal shift assay (TSA), also known as a differential scanning fluorimetry (DSF) assay.[2]

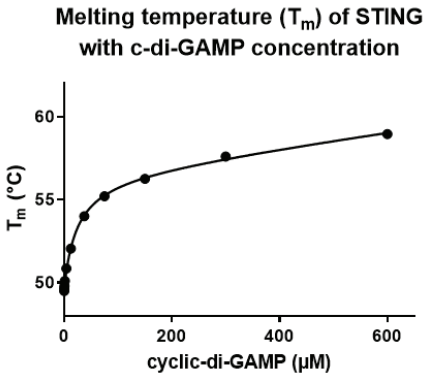
Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Images



Lane 1: MW Markers
Lane 2: STING M284 variant (4 µg)
Lane 3: STING M284 variant (R232 allele) (2 µg)

Representative gel image shown; actual purity may vary between each batch.



Binding Activity of STING M284 variant (Item No. 24594). STNG M284 variant (5 µg) was incubated with serial dilutions of 3'3'-cGAMP (Item No. 17966) and SYPRO® Orange dye. The detected increase in T_m indicates binding.

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Description

STING M284 variant (human, recombinant) contains amino acids 138-379 of the wild-type variant (R232) with a methionine substituted for arginine at position 284. Stimulator of interferon genes (STING) is a component of the innate immune response that binds to cyclic dinucleotides, which are bacterial second messengers, leading to activation of NF-κB and transcription of immunomodulatory genes, including type I interferon (IFN).[3-6] The R232 variant of STING is the most common variant in the human population, found at a frequency of 57.9% in the 1000 Genome Project.[7] The SNP variant H232 is found at a 13.7% frequency. The R284M mutation in STING is associated with constitutive activation of downstream signaling. It increases the propensity of STING to dimerize and associate with the kinase TBK1, enhancing the ability of STING to activate IRF3 and NF-κB and induce a type I IFN response.[8] However, the R284M mutation occurs outside of the dimerization region between positions 153-177, so rather than a direct effect on dimerization, it is predicted to promote or inhibit binding of a cellular factor that stabilizes or impairs STING dimerization.

References

1. Diner, E.J., Burdette, D.L., Wilson, S.C., *et al.* The innate immune DNA sensor cGAS produces a noncanonical cyclic dinucleotide that activates human STING. *Cell Rep.* **3(5)**, 1355-1361 (2013).
2. Niesen, F.H., Berglund, H., and Vedadi, M. The use of differential scanning fluorimetry to detect ligand interactions that promote protein stability. *Nat. Protoc.* **2(9)**, 2212-2221 (2007).
3. Sun, L., Wu, J., Du, F., *et al.* Cyclic GMP-AMP synthase is a cytosolic DNA sensor that activates the type I interferon pathway. *Science* **339(6121)**, 786-791 (2013).
4. Wu, J., Sun, L., Chen, X., *et al.* Cyclic GMP-AMP is an endogenous second messenger in innate immune signaling by cytosolic DNA. *Science* **339(6121)**, 826-830 (2013).
5. Konno, H., Konno, K., and Barber, G.N. Cyclic dinucleotides trigger ULK1 (ATG1) phosphorylation of STING to prevent sustained innate immune signaling. *Cell* **155(3)**, 688-698 (2013).
6. Burdette, D.L., Monroe, K.M., Sotelo-Troha, K., *et al.* STING is a direct innate immune sensor of cyclic-di-GMP. *Nature* **478(7370)**, 515-518 (2011).
7. Yi, G., Brendel, V.P., Shu, C., *et al.* Single nucleotide polymorphisms of human STING can affect innate immune response to cyclic dinucleotides. *PLoS One* **8(10)**, e77846 (2013).
8. Tang, E.D. and Wang, C.-Y. Single amino acid change in STING leads to constitutive active signaling. *PLoS One* **10(3)**, e0120090 (2015).

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